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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/955,912	09/18/2001	Paul H. Moose	10764-003-999	9919
24341	7590	12/22/2004	EXAMINER	
MORGAN, LEWIS & BOCKIUS, LLP. 2 PALO ALTO SQUARE 3000 EL CAMINO REAL PALO ALTO, CA 94306			TALAPATRA, ANIKA F	
			ART UNIT	PAPER NUMBER
			2631	

DATE MAILED: 12/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/955,912	Applicant(s) MOOSE, PAUL H.	
	Examiner Anika F. Talapatra	Art Unit 2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7, 8 and 12-15 is/are allowed.
- 6) ☒ Claim(s) 1-6, 9-11 and 18-21 is/are rejected.
- 7) ☒ Claim(s) 7-8 and 12-14 is/are objected to.
- 8) ☒ Claim(s) 16 and 17 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>18/9/01, 18/9/01</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse, over the phone on 6 December 2004, of claims 1-15 and 18-21 is acknowledged.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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2. Claims 1 to 4 and 18 to 21 rejected under 35 U.S.C. 102(b) as being anticipated by Huang et al. (U.S. Patent 5991289) (hereafter referred to as Huang). Huang teaches a method and system for synchronization of a received digital signal to a transmitter (see Huang, columns 4-9 and figures 3-4).

As to claims 1 and 18, Huang teaches a method and system for synchronizing a receiver to a transmitter, comprising receiving a digital signal, delaying the digital signal by an interval, and correlating the signal and the delayed signal to create a correlator output (see Huang, column 4 lines 60-68, column 5 lines 1-9, and figure 4 element 10).

As to claims 2 and 19, Huang teaches a method and system for synchronizing a receiver to a transmitter wherein the magnitude of the correlator output is compared to a preset threshold, and when the magnitude exceeds the threshold, a packet is detected at the receiver (see Huang, column 8 lines 30-55 and figure 4 element 168).

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As to claims 3 and 20, Huang teaches a method and system for synchronizing a receiver to a transmitter, wherein a maximum peak of the correlator output is determined (see Huang, column 9 lines 14-45 and figure 3). The Fast Fourier Transform (FFT) of the input signal is multiplied with a phase reference symbol and the result is Inverse Fast Fourier Transformed (IFFT) (see Huang, figure 3 elements 20, 25, 28, and 22). A peak is detected in the output of the IFFT (see Huang, figure 3 element 24). This is functionally equivalent to determining the sample point at which the magnitude of the correlator output is a maximum, as claimed by the applicant. As well, a delay filter (see Huang, figure 4 elements 162 and 164) provides a one-sample smoothing of the input (see Huang, column 6 lines 11-15). This is functionally equivalent to back-biasing by at least one time sample, as claimed by the applicant.

As to claims 4 and 21, Huang teaches a method and system for synchronizing a receiver to a transmitter, wherein the Fast Fourier Transform (FFT) of the input signal is multiplied with a phase reference symbol and the result is Inverse Fast Fourier Transformed (IFFT) (see Huang, figure 3 elements 20, 25, 28, and 22). A peak is detected in the output of the IFFT (see Huang, figure 3 element 24), and from this the carrier frequency offset is determined. The phase shift can then be estimated as an estimate of the fractional portion of the carrier frequency offset. This is functionally equivalent to determining the sample point at which the magnitude of the correlator output is a maximum, and determining the phase shift of the correlator output where the output is maximum, wherein the phase shift is an estimate of the fractional portion of the frequency offset.

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 5 and 6 rejected under 35 U.S.C. 103(a) as being anticipated by Smart et al. (U.S. Patent 6735255) (hereafter referred to as Smart).

As to claim 5, Smart teaches a method for synchronization of a receiver to a transmitter (see Smart, column 8 and figure 4), comprising receiving a digital signal, demodulating the symbols of the digital signal (see Smart, column 8 and figure 4 element 402), and correcting for a fractional portion of the frequency offset (see Smart, column 8 and figure 4 element 406).

As to claim 6, Smart teaches a method for synchronization of a receiver to a transmitter (see Smart, column 8 and figure 4), comprising demodulating the symbols of the digital signal using a Fast Fourier Transform (FFT)(see Smart, column 8 and figure 4 element 402).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claim 9, 10, and 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Smart further in view of Kadous (U.S. Patent Application Publication 2001/0036234) (hereafter referred to as Kadous).

As to claim 9, Smart does not teach dividing each vector by a modulation symbol value to obtain the channel transfer function. Kadous teaches a method for channel estimation of the channel transfer function, using first a least squares (LS) algorithm (see Kadous, page 3 paragraph 32), and then using a coefficient interpolator and channel estimator unit (see Kadous, page 3 paragraph 41 and figures 1 and 2). This is functionally equivalent to dividing each vector by a modulation symbol value to obtain the channel transfer function, as claimed by the applicant. It would be obvious to one of ordinary skill in the art to estimate the channel in the system taught by Smart, as a channel transfer function can be used to correct for phase, frequency, and magnitude changes in the received signal.

As to claims 10 and 11, Smart does not teach estimating odd frequency values for each of the channel transfer functions using an interpolation algorithm. Kadous teaches a method for channel estimation of the channel transfer function, using a coefficient interpolator and channel estimator unit (see Kadous, page 3 paragraph 41 and figures 1 and 2). This is functionally equivalent to estimating odd frequency values for each of the channel transfer functions using an interpolation algorithm as taught by the applicant.

Allowable Subject Matter

5. Claims 7, 8, 12, 13, and 14 objected to as being dependent upon a rejected base claim 5, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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6. Claim 15 allowed. The following is an examiner's statement of reasons for allowance: A comprehensive search of prior art failed to teach, either alone or in combination, a method for synchronizing a receiver to a transmitter comprising the combination of all the steps as recited in claim 15. Specifically, the prior art of record failed to teach the combination of extracting long sync symbols from the digital signal; correcting for a fractional portion of frequency offset; extracting vectors of modulation values of data sub-carriers with progressive trial integer offsets; dividing each vector by long sync symbol modulation values to obtain channel transfer functions; estimating odd frequency values for each of the channel transfer functions; correlating the interpolated odd frequency values of the channel transfer function and the actual odd frequency values; and selecting a correlation value to identify an integer frequency offset number, as recited in claim 15.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- i. U.S. Patent 5991289, Huang et al.;
- ii. U.S. Patent 6735255, Smart et al.;
- iii. U.S. Patent 6785349, Rosenlof et al.;
- iv. U.S. Patent 5539783, Papson;
- v. U.S. Patent Application Publication 2001/0036235, Kadous;
- vi. U.S. Patent Application Publication 2001/0053175, Hctor et al.; and
- vii. U.S. Patent 5177740, Toy et al.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anika F. Talapatra whose telephone number is 571-272-6039. The examiner can normally be reached on 08:00-16:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A.T.


MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER